

CLAIMS

What is claimed is:

1 1. A method for data storage and retrieval from a network of servers, said
2 method producing a distributed data storage system with a level of redundancy, said
3 method comprising the steps of:

4 a. defining an amount of data pieces;
5 b. defining a minimal amount of data pieces k needed to restore a data file;
6 c. for a distributed arbitrarily-connected network of L servers, defining a
7 number M of the servers that could be rendered inaccessible;
8 d. creating at least $M+k$ data pieces for storage on at least $M+k$ servers;
9 whereby the ability to restore the data file from M servers is retained and the
10 optimal utilization of data storage means obtained.

1 2. The method as defined in Claim 1 wherein said data pieces are numbered,
2 interchangeable, and of equal size.

1 3. The method as defined in Claim 1 wherein $k \leq n$.

1 4. The method as defined in Claim 1 wherein $M < L$.

1 5. The method as defined in Claim 1 wherein the number of data pieces n
2 depends on the fault tolerance level of and the number of servers in the network.

1 6. The method as defined in Claim 1 wherein the amount of redundancy data
2 stored for each file is incremented by steps of $1/k$ of the original file size and could be
3 varied for each file.

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1 7. A system for data storage and retrieval from a network of servers, said
2 system providing data storage with a controllable level of redundancy, said system
3 comprising for each file:

4 a predetermined amount of data pieces n;
5 a minimal amount of data pieces k needed to restore a data file;
6 a predetermined number M of servers in a network containing L servers, that
7 could be rendered inaccessible;
8 at least M+k data pieces for storage on at least M+k servers;
9 wherein the ability to restore a data file from M servers is retained and the optimal
10 utilization of data storage means is obtained.

1 8. The system as defined in Claim 7 wherein said data pieces are numbered,
2 interchangeable, and of equal size.

1 9. The system as defined in Claim 7 wherein $k \leq n$.

1 10. The system as defined in Claim 7 wherein $M < L$.

1 11. The system as defined in Claim 7 wherein the number of data pieces n
2 depends upon the fault tolerance level and the number of servers in the network.

1 12. The system as defined in Claim 7 wherein the amount of redundancy data
2 stored for each file is incremented by steps of $1/k$ of the original file size and could be
3 varied for each file.

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